

INTISARI

Kanker payudara merupakan penyakit mematikan. Melalui program *screening* deteksi dini *mammography* menunjukkan tingkat kematian penyakit kanker payudara dapat diturunkan. Namun *mammography* masih memiliki kelemahan hasil *screening false positive* dan *false negative*. *Computer Aided Diagnosis* (CAD) dalam beberapa dekade terakhir telah dikembangkan untuk membantu ahli dalam mengidentifikasi abnormalitas pada citra mammogram. Pada *capstone project* ini dilakukan penelitian pengembangan CAD berupa aplikasi yang dapat melakukan deteksi massa abnormal pada citra mammogram. Aplikasi ini dinamakan NeuralSIGHT yang menggunakan *Convolutional Neural Network* (CNN) untuk melakukan deteksi objek. CNN dalam pencitraan medis telah menunjukkan peningkatan kinerja dalam hal deteksi dan klasifikasi massa dibanding metode sebelumnya. Pada proyek digunakan *framework* detektor *You Only Look Once* versi ke-empat (YOLOv4) yang dilatih pada *database* mammogram CBIS-DDSM. Kinerja model yang selanjutnya dievaluasi pada dua *database* mammogram MIAS dan INbreast menggunakan metrik evaluasi *average precision* (AP₅₀) standar Pascal VOC Challenge menghasilkan skor masing-masing sebesar 45,73% dan 51,28%.

Kata Kunci: *Mass detection, Mammography, CAD, CNN, YOLO*

ABSTRACT

Breast cancer is a deadly disease. Through early detection screening program with mammography, shows that the death rate of breast cancer can be lowered. However, mammography still has disadvantage of false positive and false negative screening results. Computer Aided Diagnosis (CAD) in recent decades has been developed to assist experts in identifying abnormalities on mammogram images. In this capstone project, research on CAD development in form of desktop application that can detect abnormal masses on mammogram images was done. The application is called NeuralSIGHT which uses Convolutional Neural Network (CNN). CNN in medical imaging has shown improved performance in terms of mass detection and classification over conventional methods. The project uses the fourth version of You Only Look Once detector framework (YOLOv4) which is trained on the CBIS-DDSM mammogram database. The model's performance was then evaluated on two mammogram databases: MIAS and INbreast using the Pascal VOC Challenge standard average precision (AP50) evaluation metric resulting in a score of 45.73% and 51.28%, respectively.

Keywords: Mass detection, Mammography, CAD, CNN, YOLO